



1<sup>st</sup> TWLWG Meeting  
Niterói, Rio de Janeiro, Brazil, 30<sup>th</sup> Mar- 1<sup>st</sup> Apr, 2009

Paper for Consideration by TWLWG

## Report of the Chart Datum Working Group of the Baltic Sea Hydrographic Commission

[9 March 2009]

<b>Submitted by:</b>	Finland
<b>Executive summary:</b>	This paper reports of the work of the Report of the Chart Datum Working Group of the Baltic Sea Hydrographic Commission. It proposes the consideration of the definition "mean sea level".
<b>Related documents:</b>	<i>None</i>
<b>Related projects:</b>	<i>None</i>

### Introduction/Discussion

The Baltic Sea Hydrographic Commission (BSHC) has established a Chart Datum Working Group. The primary tasks for the group are the following:

- to study the feasibility to use the European geodetic height reference system as a principal alternative for a harmonised vertical reference system for Baltic Sea nautical charts,
- to specify the existing differences of chart datums used in the Baltic Sea area, especially
  - o possible inconsistency in the nations area
  - o differences across the borders of the neighbouring countries
  - o differences compared to the common geodetic height datum
- to study
  - o the status of water level information
  - o distribution of water level information
  - o interpolation and prediction of water levels
- to prepare recommendations how the sea level and its variations should be shown on nautical paper and ENC charts and publications, and conveying water level information to mariners [ref. IHO T.R. A2.5.2. note ii].
- to clarify the role of other international bodies on this subject and find out points of contacts to them
- keep close contact to HSSC Tidal and Water Level Working Group

The ChartDatumWG is now studying the differences between national Chart Datums and in some countries differences between areas in relation to a common geodetic reference frame (The Baltic Sea Levelling Ring, BLR)

One of the basic issues is the definition "*mean sea level*". In principle this definition is dependent only on the length of time series of observations and the stability of the tide gauge (mareograph) on the crust of the earth. However, in the Baltic Sea area we have met problems with the persistence of the sea level itself (water flow in the Danish straits) and the effect of the post glacial rebound in the northern part of the Baltic Sea. Also we have found that several countries have used some geodetic datum as a Chart Datum. The differences in practise may be small, but the fundamentals of the Chart Datums do not follow, or even maybe cannot follow IHO technical resolutions.

In some cases even well-defined mean sea level may prove out to be too inaccurate reference for depth measurements. Under such circumstances the sea level should not be used as a reference at all. Instead, the geodetic height frame could serve as the primary reference of depths and the true depth calculation would require the knowledge of the water level height in the same system. At least in the Baltic Sea area this solution would reliably solve the accurate harmonization problem between the neighbouring countries and even between countries on the opposite shores.

### **Proposal**

I - as the Chair of the BSHC ChartDatumWG - propose to the TWLWG to consider the definitions of "*mean sea level*" by taking into account the specific circumstances which may have effect on water level and depths on non-tidal areas.

### **Justifications and Impacts**

Exact and feasible definitions for terms related to water level on non-tidal areas have a great importance for the safety of navigation, especially when there seems to exist a clear tendency to accept narrower underkeel clearances compared with tidal areas.